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DIGESTION;

THE

INFLUENCE OF ALCOHOLIC FLUIDS

ON THAT FUNCTION,

AND ON THE

VALUE OF HEALTH AND LIFE.

WITH A SCHEME FOR RENDERING THE

WORKING CLASSES INDEPENDENT OF PARISH RELIEF.

BY

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1067.

The following Lecture was delivered on the 25th of May, at the "Aldersgate Literary and Scientific Institution," at the request of the Friends of Abstinence from Intoxicating Fluids. Should its perusal induce, even one fellow-being to work out self-reform and independence, the writer will have derived sufficient recompense for his labour.

20, *Gower-street*, *Bedford-square*,
10*th June*, 1841.

DIGESTION, &c.

If the circumstance of being unable to write one's name be taken as a test of ignorance, then the fact, that upwards of 40 per cent. of the population of England and Wales are in this condition, cannot fail to produce a melancholy interest in every well-wisher of his country. There is one circumstance, however, which deserves attention in tracing out the bearing of this fact to its full extent. Reading and writing must be viewed merely as means to an important end. In this point of view, they are highly valuable acquirements; but abstractly considered, they are mere accomplishments, which frequently obtain for their possessors credit for knowledge, to which the latter are not entitled. That they are indispensable acquisitions to all those who are anxious to store their minds with substantial knowledge is beyond dispute. Yet we often find in our intercourse with society, that the most valuable practical men are those who shun literature in a great measure; and the reason is obvious, because they exercise the valuable active powers which nature has given them, and thus acquire more practical views than they can derive from books.

Hence, the great mistake in the education of the present day, consists in testing talent by the means, instead of by the end of education. A person is said to be an excellent Latin, Greek, or English scholar, acquisitions which after all, are mere proofs that he retains in his memory two or three columns of corresponding words with different sounds, instead of being distinguished by the development of his mind, as evidenced by the amount of physical truth, that is of substantial knowledge which he possesses.

If it were wished to form the mind of a boy to steadiness, perseverance, and abstinence from vice, it is not surely, by directing him to the study of the false gods of the heathens; but if he would be steady, he will gain an acquaintance with the unvarying and eternal laws of the true God of the universe; if he would be persevering, he will derive encouragement to his industry, by having opened to his view on the acquisition of every new fact, a brighter and wider range of happiness and of goodness; and if he would abstain from vice, the study of immutable laws will impress upon him the practical deduction, that the infringement of every law is followed necessarily by its own punishment, that the knowledge of the law is required in order that its injunctions may be observed, and that obedience to the laws of the Creator is necessarily attended with health and happiness.

It is to ignorance of these first principles, that much of the gluttony and drunkenness which are so prevalent may be attributed. Men have not been taught, as part of their education, that they have organs which require attention; and thus they daily make experiments upon themselves, which if they were to attempt upon even a dog, would make them shudder. Physiologists have been reprobated for experimenting upon the inferior animals, for the purpose of acquiring knowledge which might be beneficial to their fellow-creatures. They may have given an ounce or two of alcohol, to ascertain the effect which it would produce upon the animal economy. The subject was at best a dog.—But when we come to think of men who could swallow four bottles of port wine, containing one bottle of poisonous alcohol, without any ulterior object of science to serve—we must either conclude that they are woefully destitute of knowledge or reflection, or that they are determined suicides.

On the other hand, we find men of the best intentions infringing the laws established in the human frame. I was some years ago consulted by a worthy missionary, previous to his departure to the most distant Eastern lands, with regard to the propriety of fasting as a religious observance. I told him, that I considered the sensation of appetite and hunger as a most important law in the animal economy, destined by the Creator for the most beneficial purposes, that it ought to be obeyed as a matter of duty, and that if infringed, it would necessarily produce some prejudicial effect; *because it is* no argument in favour of any such experiment upon human life, that life does not terminate upon its adoption, or that the symptoms of some frightful disease are not instantly ushered in. The seeds of future mischief may be sown by one experiment, and may only lie dormant until a second or succeeding infringement shall cause them to sprout forth into living activity. One fit of drunkenness may not produce death or immediate disease, but in one night of intemperance, I have often known the constitution to be ruined irremediably; and at the very least, the subject who has been guilty of the excess, must be pronounced as having attempted to thwart unchangeable and eternal laws. The absence of intention from his state of inebriety would not be received as a palliation in the instance of human laws; how much less therefore in those of the highest grade!

In treating of the effect of any influence on the human economy, the recent improvements of science have demonstrated that we are not to be guided by the study of individual instances, but that we are to draw deductions from masses of individuals. The new registration act, has in this respect, conferred great benefit not only upon the student of vital statistics, but also upon the inhabitants of England and Wales It is only to be regretted, that the operation of the act was not also extended to Scotland and Ireland, because we should thereby have obtained important statistical data respecting the influence of abstinence from intoxicating liquors upon health and life, which would have been especially valuable in reference to the latter country. In the absence of such information, we must rest contented with less general deductions. However, they will be found sufficiently extensive in their range, to prove the fallacy of the assertion, too often made by the opponents of abstinence, that their experience does not bear out the principles advocated by the supporters of abstinence; the philosophical mode of treating the argument, however, is not by considering what appears to be the effect on one or two isolated cases, but what is the relative state of health and disease with and without abstinence, on large masses of society, or on mankind in general. In considering the subject as fully as our limits will allow, it will be convenient to treat of

I. THE NATURE OF DIGESTION.

II. THE INFLUENCE OF ALCOHOL UPON THAT FUNCTION ; AND,

III. THE EFFECT OF ALCOHOL ON THE VALUE OF HEALTH AND LIFE.

1. *Hunger and Thirst*

Are the preliminary steps to digestion; they constitute a law implanted in the animal economy, for the purpose of inducing the living animal to take such nourishment as is required for the supply of the waste, which all animated nature is continually undergoing. If the dictates of the sensation of hunger and thirst are rationally obeyed, satisfaction and healthy digestion are the result; but if, on the contrary, these important sensations are neglected, weakness and disease must necessarily ensue. From the returns made by persons connected with the diabolical slave-trade, we learn that a human being cannot exist above nine days without food. But the wonderful resources of nature were never more remarkably displayed, than in a case which occurred to myself some years ago. A poor idiot who was bed-rid, had received a sudden fright from a peal of thunder, which caused him to refuse all sustenance ; and so far did he carry his prejudice, that he would allow no water to cross his lips which was not pure and crystal from the spring. In this condition, he remained for 74 days, when tired nature at last yielded and gave up the struggle. The explanation was simple, but it was as beautiful as it was simple. The poor creature by want of exercise, and by possessing a strong appetite, had previously acquired great fatness. This deposit acted the part of a preventer brace to the mast; the fat was absorbed and contributed to renew the waste of the natural stimulus to the heart. But as soon as this source of nourishment was exhausted, death inevitably closed the scene. Appetite, or in its more advanced stage, *hunger*, teaches man to seek for solid food, and *thirst* suggests the propriety of rendering the solid mass more pulpy and dilute, by the employment of drink. Experience and reason must direct the proper objects to be employed for these purposes.

2. *Mastication or Chewing.*

When a solid portion of food is seized by the front teeth, it is conveyed into the cavity of the mouth, by the assistance of the lips, jaws and tongue, and the auxiliary muscles. By aid of the tongue, it is placed between the opposing jaws, where it is ground to a proper consistence. But the action of the jaws in grinding the morsel introduced between them, at the same time, calls into play the compressing power of the muscles of the cheek upon the parotid gland which is placed before the ear, and expels its secreted fluid, the saliva, into the mouth, to assist in comminuting the nutritive matter. Besides this mechanical agency, there is however, a nervous action called into operation; the masticated matter acts upon the tongue and adjacent parts, inducing a sympathy with the glands placed under the tongue, and causes them to pour out their copious contents. The object of mastication or chewing, is therefore to reduce the food to such a consistence, as shall fit it for its reception and proper digestion in the stomach; this is well illustrated in the instance of animals which are not supplied with teeth. The common fowl, for example, has no teeth; but it has a muscular apparatus, termed the gizzard, which powerfully compresses the introduced food, and by means of pebbles and stones, which are a necessary article of food, with the class of animals referred to, an artificial substitute for the teeth is provided. From attention to these facts, therefore, we are taught that, the preparatory step of digestion consists of the comminution of solid food, by means of the apparatus set apart in the mouth for this purpose, and its mixture with a certain quantity of fluid to render it more dilute. Two questions arise from reflecting upon these circumstances. These are, what ought to be the nature of the solid food introduced, and of the liquid, which our sensations may require, in addition to that supplied by nature. The first question has been long ago solved by Dr. Prout, who directs us to nature herself for an answer to our question. Milk is the food provided at first, for the use of man. The study of the composition of milk, will throw light upon what ought to constitute the proper food of man. Milk, contains four alimentary principles: *water*, *sugar*, *albumen and oil.* Water cries the advocate for the use of intoxicating fluids, affords no nutriment? And yet, the human body consists of three-fourths of water; for, without it, "matter in its solid state, appears incapable of vitality." One great antagonist to the organization of water, and therefore to vitality, is alcohol, which we find attracts the water, and causes the wretched mummy like aspect, so distinctly observable in drunkards. Under *sugar*, are included starch and the other products resulting from chemical changes in sugar; it comprises vegetable food. *Albumen*, includes animal food under its different modifications; the inferior nutritive food belongs to the class of oils, which are difficult of digestion, and in this country, comparatively, rarely resorted to, with the exception of alcohol, which is most closely allied to the vegetable oils, the least nourishing of its class. The resolution of the second question, with respect to the nature of the liquid, which ought to be introduced in contact with the solid food, directs us to the consideration of the saliva, which is the natural diluent to the food, and is supplied by the salivary glands. All the fluids of the human body, present but an insignificant quantity of solid matter, in proportion to the fluid part; accordingly, we find, that the saliva contains ninety-nine and one-third per cent of water, the remainder being principally common salt and mucus. If we therefore follow the rules which nature has laid down, it would appear that water is sufficiently stimulating for the purposes of diluting the masticated food, and preparing it for its digestion in the stomach.

3. *Deglutition or Swallowing.*

The operation of mastication, is a voluntary act, but the next step, or that of deglutition or swallowing, is of a different character. So soon as the food is sufficiently reduced to a pulpy state, the natural impulse appears to be, to carry it by the assistance of the tongue to the back part of the mouth. This is all the voluntary exertion that is required on the part of the individual. The instant that it touches certain nerves which guard the throat with this object in view, they are excited, and carry the impression to the spinal marrow; the impression is conveyed or reflected by a different nerve to the point of excitement, and motion is the result; this motion being the contraction of the gullet, and consequent grasping of the morsel, which is quickly conveyed by this important canal into the digesting organ.

4. *Chymification or proper Digestion.*

So soon as the food is introduced into the stomach, it appears to have the power of stimulating the contents of that organ, and producing a copious secretion of fluid. In this way the mass becomes still more dilute, and after the lapse of some time, varying according to the nature of the food, the greater portion is completely dissolved, and assumes a liquid aspect; this fluid is termed chyme. It has long been an anxious subject of inquiry among physiologists, to determine the nature of the influence by which this solution is operated; water alone is not capable of dissolving either vegetable or animal matter; we must therefore seek for some more energetic medium for producing such a powerful effect. Saliva, it has been observed, in contact with sugar, converts that substance into lactic acid, and I have found, that in diabetes, a disease, where the vegetable food is changed into sugar, the whole of the latter is gradually converted into lactic acid. We have therefore, from this fact, the explanation of a simple means, by which one acid may be produced. Dr. Prout has inferred from some experiments, that during digestion free muriatic acid is present in the stomach; his mode of determining this point was by a negative experiment. He did not obtain the free acid in an isolated state, and I have shown that this would be necessary, because by his method of experimenting, a portion of common salt contained in the stomach might have been decomposed. His view has, however, received some degree of confirmation from the experiments of Eberle, who has succeeded in dissolving, or digesting coagulated albumen, by means of dilute muriatic acid retained for some time in contact with the internal coat of the stomach of an animal. Dr. Beaumont has also shewn, that the fluid part of the contents of the stomach during digestion is acid; and that if a portion of the fluid part be placed in a wine glass along with a masticated piece of beef, the latter will be dissolved or digested, as rapidly as if it were placed in the stomach, provided it were kept at the same temperature as that to which it is exposed in the stomach, or about 98°. The observation of Schultz, however, would seem to prove, that no muriatic acid is contained in the stomachs of herbivorous animals during digestion; and as this process appears to be precisely analogous in all classes of mammalia, the conclusion deducible, would appear to militate against the muriatic acid theory. It is certain that the acid present is exceedingly dilute, and the question remains for solution, Is lactic acid sufficient for this purpose?

5. *The Liver an important organ in digestion.*

The food having undergone solution in the manner described, is conveyed by the motion of the stomach into the small intestines, where it is converted from chyme into chyle, a milky fluid. Some have supposed, that this alteration is induced through the influence of the bile which is secreted by the liver, and poured out by a duct into the upper part of the small intestines. This may possibly be the case; but I am more inclined to believe, from numerous observations which I have made, that the bile is merely an excretion like other fluids which are formed to be thrown off from the system. I have found that in proportion to the diminution of bilious secretion in diseases of the liver, so also does the quantity of urea diminish which is thrown off from the system. Now it is generally admitted, that urea is the form in which the excess of nitrogen is removed from the body. The liver would, therefore, appear to be a most important organ in the process of digestion; for if this view be correct, the lungs are the organs which throw off a part of the excess of carbon, while the function of the liver is to eliminate nitrogen in the form of urea, and carbon in the form of bile. This view affords at once a most powerful argument in opposition to the introduction of any substance into the stomach, which shall interfere in the most distant manner with the functions of the liver; and any material which can possibly induce disease in that organ, will be cautiously avoided as an article of food.

II.—INFLUENCE OF ALCOHOL ON THE FUNCTION OF DIGESTION.

The proper food of man, it has been shewn, is such, as has for its basis some of the constituents of the milk, that fluid which nature has provided for human beings on their first appearance in the world. The drink, we have concluded, should be of an equally simple nature. It is true, that substances possessing a more stimulating effect, have been employed by individuals without inducing any *apparent* permanent results tending to a mischievous end. But who is the judge who brings in such a verdict? Is it the individual who is partial to the same method of procedure, and whose "will is father to the thought," or is it the person who studies a definite number of cases, and deduces the average result, comparing them carefully with a similar number in which no stimuli are employed, except such as are clearly indicated by nature.

1. *Simple food is capable of intoxicating.*

Food, alone, is a most powerful stimulus, and I believe few are acquainted with the effect which food of the most simple kind is capable of producing, under particular circumstances. For the benefit of those persons who are ignorant of the stimulating influence of the simplest diet, I extract the following account from the narrative by Captain Bligh, of the celebrated mutiny of the Bounty:—The boat's crew having crossed the Pacific on the allowance of $\frac{1}{25}$th of a pound of bread for breakfast, and the same quantity for dinner; "on the 29th of May, 1789, we reached the coast of New Holland: I sent out parties in search of supplies, while others of the people were putting the boat in order. The parties returned highly rejoiced at having found plenty of oysters and fresh water. The symptoms of having eat too much began to frighten some of us, but on questioning others who had taken a more moderate allowance, their minds were a little quieted; the others, however, became equally alarmed in their turn, dreading that such symptoms (*which resembled intoxication)*, would come on, and that they were all poisoned, so that they regarded each other with the strongest marks of apprehension, uncertain what would be the issue of their imprudence. Fortunately the fruits we obtained here, proved wholesome and good, of which I was soon persuaded when I saw the birds eat them without experiencing any hurt." This incident is sufficient to demonstrate, that the most common food supplies an exceedingly powerful stimulus to the system, capable even of producing an intoxicating result: and when we come to study the mode in which stimuli act, the explanation is sufficiently simple. We shall understand this more clearly, by taking a brief survey of the phenomena induced by alcoholic fluids on the digestive organs, and by tracing their course through the system.

2. *Alcohol injures the organ of taste.*

When a morsel of food is introduced into the mouth, the result is the stimulation of the salivary glands and the flow of a large quantity of saliva, which is speedily mixed with the masticated matter. But when an alcoholic fluid is imbibed, there is something more which takes place. Not only are the glands and mucous membrane stimulated, but all the fluids with which the alcohol comes in contact, have immediately a tendency to unite chemically with that liquid. This is the principle by which anatomical preparations are kept from decay. Water is essential to the existence of vitality; but its presence, when vitality is fled, affords the readiest facilities for putrefaction. The result of such constant irritation is to render the sensitive glands of the tongue less subservient to the purposes of taste, and the whole organism of this sense dull and unnatural. Every one may have observed, that great drinkers are, comparatively, small feeders, and at any rate, that they are more liable to inequalities of taste, than those who are abstinent or temperate. Those who are in the habit of indulging in strong liquors, appear to be liable to a complete chemical change in the aspect of the mucous membrane;

at least, I have observed in some confirmed whiskey drinkers, that the interior of the mouth presented a black appearance. Individuals in this condition must eat, in a great measure, merely to assuage the pangs of hunger; the highly pleasureable sensation produced by the contact of the food with the organs of taste, must be inappreciable to them. Alcohol, when taken into the mouth produces a sensation of burning, which proceeds from two causes: the heat given out by its combination with the fluid in the mouth; and also its action on the nervous system. The same result occurs during the passage of the fluid along the gullet into the stomach, in a greater or less degree; the stimulating effect of alcohol is still continued, when it comes in contact with the coats of the stomach, and this appears to be the great argument in favour of the use of alcoholic fluids; they are said to assist digestion by acting as a stimulus. And there appears to be some degree of plausibility in the idea, that if nature is not capable of doing her own work, artificial assistance should be administered to her; this could only be correct reasoning, if men were made, as Hamlet says, "abominably by nature's journeymen." It has been further asserted, that men were not created to live in their present artificial state, and that cities were never intended to be formed; as if the social habits of man were not given for the most beneficent purposes. Men, it is said, are now existing in civilized countries, in a most artificial state. We ask, what is meant by this assertion? Is his sleep artificial? Is eating good substantial food artificial? Is living regularly an artificial state? Those who exist in this manner will enjoy good health; and in a majority of cases, those who practise an opposite course, will receive, as the fruits of their departure from the established laws, which direct human existence, suffering and sickness. I believe there will be found few who have studied scientifically the human system, who will uphold the doctrine, that the use of alcoholic fluids is necessary in a state of health; or oppose the statement, that the healthy human stomach requires no more than the stimulus of wholesome food for its proper action. If this be admitted, then it follows, that alcoholic fluids must be placed either among the luxuries, or among the medicines of life. If they be classed in the category of luxuries, their beneficial influence will be restricted, by even their most strenuous advocates to a moderate use; and in this case, they are only upon a level with medicines, most of which are only salutary when administered in small doses.

3. *Alcoholic fluids disorganize the stomach.*[*]

When medicines act upon the matters of which the body is composed, and interfere with their natural formation, they become dangerous if their administration be persevered in; this is the case with lead and arsenic, which decompose the internal surface of the stomach, when they are used above a certain length of time. Alcohol, likewise, by its stimulant property, and by its chemical action in withdrawing water from the animal matter, has a tendency to produce diseases of the stomach, such as inflammation, and schirrus or cancer. It has been affirmed, and the statement has obtained some degree of notoriety, that alcoholic fluids, when taken in moderation, cannot do harm; now, it may with equal certainty be affirmed, that there are no data extant, from which we can adduce any such conclusion, but on the contrary, by reasoning from analogy the very opposite inference should be adopted. Would any one, whose opinion is of value on such a question, admit that any other equally powerful medicine might be taken daily during life with impunity? Would any medical man I say, insure the health of a fellow creature, were he to take a little arsenic every day, for thirty or forty years; or would he consider the life of such an individual equally valuable with that of one who abstained from such articles?

4. *Alcohol decomposes the digestive fluid.*

It has been already stated, that the food in the healthy state undergoes solution in the stomach; and that an artificial fluid, possessing similar properties to that contained in the stomach, may be formed by digesting the internal coat of the stomach of a calf, in dilute muriatic acid. Now there is a remarkable fact connected with this fluid, which has not hitherto been noticed, so far as I am aware, by persons who have treated of the influence of alcohol upon the constitution, viz., that alcohol, when added to the digestive fluid produces a white precipitate; and that the fluid is no longer capable of digesting either animal or vegetable matter. This is one of the most important facts in the consideration of the whole question, and I think may ultimately tend to throw light upon the circumstance, that whereas spirit drinkers are lean and lanky, wine bibbers are unhealthily fat. In both cases, there is an interference with the natural process of digestion, followed, in both instances, with an unnatural result.

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[*] Under alcoholic fluids I include all liquids containing alcohol, as wine, beer, spirits, &c.

5. *Alcoholic fluids disorganize the Liver.*

Every one is familiar with the fact, that gin-drinkers are liable to a peculiar disease of the liver, which is continually aggravated by the protraction of the exciting cause; wine-drinkers, although not so liable to disorganization of this important organ, are equally subject to inflammation and fits of indigestion. Having been lately engaged in carefully studying the cases of individuals who have been labouring under diseases of the liver, proceeding from different causes, I have obtained some interesting conclusions, which throw light upon the importance of the liver as an organ of digestion, and demonstrate the necessity of avoiding the employment of all substances as food, which can in any measure affect the proper performance of the functions of the liver. I have found, that in jaundice, where there is no deficiency in the secretion of the bile, but rather it would appear an increase in the formation of that fluid, the urea in the system is also proportionally great. On the contrary, in those cases where the liver has been organically deranged by unnatural stimulants, both of these substances are deficient. Knowing, therefore, the natural quantity of these substances, we are in a condition from an examination of the quantity of both in a state of disease to predicate the condition of the liver. I conclude, therefore, that the formation of a certain quantity of these two bodies is a necessary condition of digestion. The treatment of all diseases of the liver must therefore have for its object, the restoration of proper digestion, as demonstrated by the increase in quantity of bile and urea, and no treatment which does not produce this consummation, can be considered to have completely removed the disease. Every augmentation is, a step towards this object and towards perfect health. As long, however, as very imperfect digestion continues, so long must every other organ in the system, be liable to derangement. The simultaneous appearance of diseases in various organs, is the evidence of what is termed so descriptively in common language, the breaking up of the constitution.

6. *Alcoholic Fluids act upon the Cerebellum.*

But the stimulating fluids of which we have been speaking, not only act upon the immediate digesting organs, but they likewise influence distant organs, and none more remarkably than the back part of the brain, or that portion with which the animal propensities are supposed to be connected. Men of passionate dispositions are thus goaded on to excesses, which they can scarce restrain in their sober moments, and are guilty of those disputings and disreputable proceedings, which sink them below the level of the inferior animals.

7. *Alcoholic Fluids do not act as nourishment.*

From our present knowledge of the human economy, it appears, that all food which acts as nutriment, must undergo some modification in the stomach, with the exception, perhaps of water. Starch for example, must be animalized, or converted into a substance, resembling the white of egg. Alcoholic fluids, however, undergo no change as far as we know at present. But, on the contrary, like prussic acid, when taken in excess, they are found undecomposed in different cavities of the body—as for example, in the brain, in contact with that delicate organ, where they can only serve to produce irreparable mischief.

III. INFLUENCE OF ALCOHOLIC FLUIDS ON THE VALUE OF HEALTH AND LIFE.

1. *Influence of Alcoholic fluids on Health.*

It has been affirmed by a philosophical writer on drunkenness, (Macnish), that "abstractly considered, liquors are not injurious. It is their abuse which makes them so, in the same manner as the most wholesome food becomes pernicious when taken to an improper excess." The writer, however, no where throughout the whole of his interesting work, affords any data which can authorize such a deduction. We would put this simple case to an unprejudiced person. Suppose 100 individuals were to live on wholesome food, and abstain from all alcoholic fluids; and suppose another hundred *cæteris paribus* were to use stimulating drink, which of the two sets, should we anticipate to be most healthy, at the end of a given period. We do not believe, that there would be two opinions on the subject; and yet, we are told, "abstractly considered, liquors are not injurious," and that it is their abuse which makes them so. But who is to define the imaginary line, between use and abuse? Some men become *inebriated* after drinking a few glasses, while others may escape this condition, after imbibing some bottles. But it is not a legitimate conclusion to say, that they escape with impunity to their health; this is a much nicer question than is generally imagined. Passing over the probability, that the continued use of a poison may slowly induce organic disease, it will be admitted, that all those who habitually make use of alcoholic fluids, are liable, at some time or other, to excesses; thus the wine drinker, as well as the brandy and gin-drinker, does not employ daily the same invariable quantity, but is apt to take a glass or two more upon particular occasions. Every excess is liable to produce some error in digestion, and we may affirm, without hesitation, that no error in digestion, can be otherwise than detrimental to the constitution.

The remarkable influence of the abridgement of the quantity of alcoholic fluids, in diminishing the occurrence of liver complaint in India, is strikingly exhibited in the following return from the Cameronian regiment in Bengal:—

Liver Complaints.		Consumption of Spirits.
1832	111	10,000 to 14,000 gallons.
1833	140	
1834	135	
1837	82	2000 to 3000 gallons.
1838	50	

The mean of the three years, when the large quantity of spirits was used, is 128 cases; while in the two years of temperance, the mean number of cases was 66, or about one-half.

The effect of diminishing alcoholic consumption upon the troops in Bengal, is clearly proved by the following table:—

1838	Temperance Society.	Rem. of Reg.	Sick per cent. society.	Sick Rem. Reg. per cent.
January	1953	2569	2·54	8·15
February	1840	2639	2·27	8·27
March	1542	2879	2·94	8·66
April	1359	3081	5·47	10·28
May	1282	3161	5·24	10·66
June	1364	3065	4·55	10·35
			3·65	10·20*

This result, it will be observed, was produced merely by reducing the quantity of spirits consumed. The importance of this table for the consideration of Benefit Societies is indisputable. It establishes a reduction of sickness to one-third. What the effect would have been if total abstinence had been resorted to, it is difficult to predict; but from this table we should be strongly inclined to infer, that sickness in India might be much further diminished, if total abstinence were adopted. We believe, that the eyes of men of sense and judgment are becoming opened to the absurdity of the old Indian axiom, that cold water without some stimulant is dangerous, and that the employment of cold water as a beverage, is prejudicial to health. Upon one occasion, while I was in India, cholera broke out with great virulence. The water was immediately accused of being the guilty cause. I immediately examined the water, and found it to be considerably purer than the water of the River Thames, which is universally admitted to be salubrious. I soon, however, ascertained what might be considered as a more adequate cause; for, on entering the apartment where the men affected had been working, I found that a Davy lamp, which I carried with me, was immediately extinguished.

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* British and Foreign Medical Review, Jan., 1841.

Although it must be admitted, that the use of alcoholic fluids has a great tendency to induce diseases of different kinds; yet it would be improper to assert, that we possess data for determining their exact effect upon health. Some facts, however, are on record, which raise their influence to a deplorable magnitude. Dr. Gordon of the London Hospital, observed during one year, from several thousand out cases attending at that hospital, that upwards of 65 per cent. of the diseases were distinctly produced by alcoholic fluids.

Dr. Davidson of Glasgow, has shewn, that of 367 persons affected with typhus fever, who were admitted into the Glasgow Infirmary, 103 were intemperate, and 59 a little intemperate. So that nearly one-half were addicted, at least, to frequent excesses. This circumstance, if it did not actually induce the disease, most certainly would predispose towards its infusion into the system. There are many other diseases which are brought on by the use of alcoholic fluids, such as inflammations of the brain, chest, stomach, and bowels, apoplexy, gout, and rheumatism; but these it is unnecessary to particularize. Enough has been adduced to prove the probability that Benefit Societies would have sickness diminished at least one-half, if their members were regulated by the principles of total abstinence societies.

2.—*Influence of Alcoholic fluids on the value of life.*

No human power can stay the hand of death; for death is in truth the result of life. But we possess the capacity of protracting the duration of man's existence on the earth. This is usually considered the province of the physician. It is, however, the duty of every human being to assist in effecting this desirable consummation. The Divine Volume has allotted three-score and ten years as the age of man. Is it impossible to attain this period as the average age of the population of this country? The rapid improvements in medicine, and in the habits of the people, have produced a remarkable change, in the average length of life of the community, during the present century. Sixty years ago, 1 person in every 38½ died annually; in 1838, the mortality was 1 in 45½. But in the country, the average age is considerably greater than in towns. Only 1 person in 50 dies; or the average age in the country is 50 years; while in the towns it is 37 years. So that an individual resident in the country, will have a chance of living 13 years longer than in towns, reckoning from the commencement of life. Hence it appears, that life has improved by 5 years during this century. How this state of matters is to be still further improved, is a question which must occur to every person of reflection. The power of medical science is sufficiently evinced by the fact, that sixty years ago, double the number of children died, under the age of 5 years, that die at the present day; this mortality will be still further diminished, by the proper administration of vaccination. It remains, however, to attempt the reduction of the mortality, at the subsequent periods of life.

We believe the use of alcoholic fluids and poverty to be the great cause of the excess of mortality; and it should be one part of our plan to cure the one evil, by dispensing advantageously with the other.

3. *Mortality of Mohammedans in Calcutta, and of towns in England the same.*

The effect of alcoholic liquors in abridging the average duration of human life, can only be determined by an appeal to statistical data; and although no perfectly precise deductions can be made from the facts at present in our possession, yet it may be admitted, that such a tolerable approximation can be attained, as is sufficient at least to show, that alcohol produces a decided influence.

The annual rate of mortality in England and Wales, as de- ced from the Registrar General's report, appears to be for the cities of this country, 2·7 per cent, or nearly 2¾;* that is, one death out of every thirty-seven persons in the population. Compare this with the following table:—

POPULATION AND MORTALITY IN CALCUTTA.

Denominations.	Population.	Average Mortality per annum.	Mortality per cent.	
English	3138			
Eurasians	4746			
	7884	277	3½	1 in 28
Portuguese	3181			
French	160			
	3341	417	·12½	1 in 8
Western Mohammedans	13677			
Bengal "	45067			
Moguls "	527			
Arabs "	351			
Total Mohammedans. .	59,622	1607	2¾	1 in 36
Hindoos	157,418	9558	$6\frac{1}{15}$	1 in 16
Armenians	636	25⅜	$4\frac{1}{20}$	1 in 25
Native Christians . . .	49	3½	6¼	1 in 14

In Calcutta there are 59,622 Mohammedans, all of whom abstain, of course, from spirituous liquors; the deaths amount to 1607, or 2¾ per cent.† Here, then, it is remarkable, that we have the mortality of the town population of England, equal to the mortality in the unhealthy climate of Calcutta, among one class of the population. It cannot be urged that the low mortality depends upon the population alluded to, being natives of Calcutta, and therefore inured to the climate; because only 45,067, out of 59,622 were natives of Bengal. *There must therefore be some cause operating in England, equivalent in prejudicial influence to the baneful climate of Calcutta.* What can it be, if not the use of alcoholic liquors? In Calcutta, there are 3138 English and 4746 Eurasians; the conjoint mortality per annum of this population is 277, or 3½ per cent. The question now occurs, what is the mortality among the English *per se?* We should be apt *à priori* to think, from the habits of English residents, that the mortality will be greater than the number given. Accordingly, it is stated, by a writer on the mortality of British India, that the deaths among the English in Calcutta, between the ages of 20 and 25 is 3·84 per cent.; from 25 to 35, 5·49 per cent.; from 35 to 45, 6·7 per cent; from 45 to 55, 6·18 per cent; and from 55 to 65 8·4 per cent;* the mean, therefore, of the mortality between the ages of 20 and 65, is 6·1 per cent.; or, triple the mortality of the country population of England. The mortality among the French and Portuguese is 12½ per cent.; while among the Hindoos it is 6$\frac{1}{12}$ per cent.; or according to Dr. Stewart, 3·86 per cent. only. This rate is considerably higher than we should expect to find among a population so abstemious in their habits. It is to be accounted for, however, by the circumstance, that the Hindoos of Calcutta, consisting of families, include a much larger proportion of infant life† than is to be found among Mohammedans.

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* Second Report, p. 81.

† Asiatic Journal, 1838, p. 890.

4. *Diminution of Mortality and of Alcoholic Spirits closely allied.*

To exhibit the effect upon the mortality, of diminishing the employment of alcoholic fluids, it is only necessary to examine the following table of the troops in Bengal, out of the same population.

	Consumption of Spirits.	Mortality.
1832 1833 1834	10,000 to 14,000 Gallons.	76
1837 1838	2000 to 3000 Gallons.	26 22‡

Hence it appears, that by diminishing the consumption of spirits to one-fourth, the mortality was reduced to less than a third.

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* Capt. Henderson in Trans. Asiatic Society, 1836, and India Review, 1837, p. 322.

† Asiatic Journal, 1838, p. 890.

‡ Forbes' British and Foreign Medical Review, January, 1841, p. 259, and India Journal of Medical Science, November, 1839.

It would be interesting if we could determine, from the diminution in the quantity of spirits, the reduction of mortality. In this case, the mortality in Ireland should be reduced one-third; for in 1838, the quantity of spirits consumed in that country was 12,332,724 gallons, and in 1840, 7,593,466 gallons, indicating a reduction of 39 per cent.

I regret to observe, that in India it has been recommended, by men who ought to know better, that beer should be substituted among the troops, for spirits; upon the principle, I suppose, that "one fire burns out another's burning." The testimony of Dr. Mosely, a distinguished writer on tropical diseases, is a sufficient answer to all such fallacies, and cannot be too often quoted: "I aver, from my own knowledge and custom," says he, speaking of the West Indies, "as from the custom and observation of others, that those who drink *nothing but water*, are but little affected by the climate, and can undergo the greatest fatigue without inconvenience."

5. *Females longer lived than Males.*

It cannot fail to be remarked as *a striking fact* connected with human mortality, that notwithstanding the peculiar and more severe diseases to which females are necessarily exposed, and their more delicate constitution, they are longer lived than males. The average age of males in England and Wales in 1838 was 44, while that of females was 47, giving an average of 7 per cent. of excess of mortality of males over females; this fact is the more remarkable, when we consider, that upwards of $\frac{1}{100}$th of all the deaths in the metropolis arise from diseases peculiar to females, while they are equally exposed to all other diseases of a mortal nature. To what are we to ascribe the circumstance then, that the lives of females are three years more valuable than those of males? We believe that temperance and more regular habits are among the causes, and that our view will be borne out by the opinion of those who have considered the subject with attention.

6. *Important bearing of these data on Insurance of human life.*

Human life is often considered by the generality of persons as uncertain and capricious in its extent. Because our neighbour or friend is suddenly carried off, we conclude, that life, in a general point of view, is equally uncertain. Nothing, however, can be conceived more erroneous than such an inference. A careful study of life will impress upon us the beauty of the scriptural affirmation, that "the hairs of our head are all numbered, and that not even a sparrow can fall to the earth, without the concurrence of the Creator of all." This is remarkably illustrated by the comparison in different years of the mortality in England and Wales. From 1818 to 1824, the mortality was 2·03 per cent., and in 1837 it was 2·02 per cent., or out of every 1000 inhabitants in the first period, $20\frac{3}{10}$ died; while in the second period, $20\frac{2}{10}$ paid the debt of nature; the difference being only $\frac{1}{10}$, and part of this was probably owing to error of observation. Knowing therefore the exact number of persons who are to die annually out of every 100 persons, to a minute fraction, it would be quite safe for any party, upon the receipt of, say £1. from each of the 100 persons, to engage to pay £35. in the event of the death of any of them to their heirs. Two of the number would die, and £70. would require to be paid, while the party who made the agreement would lay by for the liquidation of his expenses £30., to meet any exigency, or any excess of mortality which might occur by accident. It will be observed, therefore, that this proceeding is quite distinct from gambling. It is based upon certain and precise data, and is therefore opposed in its first principles to chance. Now this is a simple example of what is termed Life Insurance. It is founded upon a careful study of the laws of human life. But when we say that $20\frac{2}{10}$ out of every 1000 persons die, we include among the 1000 persons, the child, the adult, and the aged, the sick and the dying. But in insuring upon human life, of course the dying are excluded, and likewise hitherto the sick, although the laws of many diseases are so regular, that even the sick in numerous instances might be insured. Some very strict Insurance Offices will only insure *select lives*, that is, persons who are not threatened or affected with any organic complaint, or any disease calculated to shorten life. This diminishes of course much of the risk which is attendant where a careful selection is not made. These offices only, however, it will be observed, guard against future mischief by the present condition of the Insurer. It has been reserved for the *United Kingdom Total Abstinence Life Association* to establish itself upon principles, which not only avoid risk by the study of the present condition of the Insurer, but also, regulate his future conduct by causing him to guarantee, that he will totally abstain from one of the greatest enemies of health, and the most fruitful cause of disease. We have learned in the course of this lecture from the incontrovertible evidence of numbers, that in a large community the use of alcoholic fluids is capable of producing upwards of *one-half of the disease* occurring; and in another locality, that the reduction of the same stimulants was followed by a diminution of *two-thirds* the amount of sickness, and *two-thirds* the number of deaths. The application of this reduction in risk, is peculiar to the Total Abstinence Life Association, and places the institution upon a far safer basis than any similar Society in existence. The members of this Society being total abstainers from alcoholic liquors, it has been objected, that among this number must occur many individuals whose constitutions have been injured by their previous loose habit of life, or in fact, that many abstainers are reformed drunkards. Even in this respect, which is the worst possible view, the Association under consideration possesses an important advantage over other Insurance Companies. Because in other Offices habitual drunkards are continually presenting themselves as candidates for Insurance; while in the Abstinence Life Association, the first and most important qualification is strong evidence of habitual abstinence. There may be much dispute respecting the definition of *drunkenness*, but there can be none as to *total abstinence*. With respect to the possibility of persons gaining admission to the institution with impaired constitutions, the same objection may be urged equally against all Insurance Societies. The usual tests of selection, with the additional one, to which allusion has been already made, and which I believe, I have been the first to point out, are strictly called into requisition, and perhaps are exercised with greater severity than is customary in the majority of offices, by the Total Abstinence Life Association.

One of the most striking features of the Abstinence Life Association, is the prospect which it holds out to the labouring classes, of acquiring independence, at a period of life when bad health, or the gradual encroachments of age may threaten the gloomy accommodations of a workhouse. In exhibiting to the man of daily toil the bright view of independence, so dear to every British heart, the Association displays before him the alternative of a draught of intoxicating liquid daily, and the horrors of a workhouse, or the proper investment of the money with which the liquor is purchased, so as to render him independent in his declining years. The Association offers the readiest facilities in this respect, by admitting weekly payments of premiums on small sums insured. It is not to be supposed, that the majority of labouring men can appreciate without instruction the bearing of such a proposition. I therefore suggest, that the heads of families may essentially contribute to the desirable end of dispensing in a great measure with the present obnoxious poor rates, by teaching a practical lesson to their servants. I propose that servants should be advised to forego the purchase of beer with their daily beer money, and to invest it in a Policy of Insurance, or in a deferred annuity. For example, a pint of porter daily will cost about *one shilling* and *one penny* per week. *If a man were to commence paying this sum at the age of twenty in weekly payments,* he would be entitled at the age of 50 to receive £100.

Again, a person commencing at the age of twenty-two, and paying about one shilling weekly, would be entitled at the age of fifty to receive an annuity of £10. during the remainder of life. Or the same sum may be paid for the purpose of insuring an annuity for a widow, after the death of a husband. Suppose now that every male and female servant were to commence at twenty-two to make a deposit with the Insurance Company of one shilling weekly, they would be comfortable in a great measure at the age of fifty, by being possessed of an annuity, each of £10.; and in case of marriage, the joint £20., with the assistance of a little industry, would make them sufficiently independent.

It appears to me, that this system could be easily organized among Abstinence Societies, by the formation of committees, or *sub-sections for the insurance of beer money*, and would be well worthy the attention of the friends of this great cause throughout the country, I have been further strengthened in the view which I have here suggested, by some inquiries which I have made respecting pauperism, since I engaged to deliver this lecture. I was anxious to ascertain the average age at which persons became paupers, in order that it might be known what annual premium was required to insure a certain sum, at the average age at which paupers receive relief for the first time. I accordingly applied to the authorities of my parish, Saint George and Saint Giles, for a return of all paupers who had obtained assistance for the first time during 1840. I am happy in having this opportunity of expressing my best thanks for the kind and ready manner in which my application was acceded to, and particularly to James Ashmore, Esq., the Chairman, and also to Mr. Robinson, and Mr. Dix. The return was somewhat different from what I expected; I did not imagine that pauperism commenced at such an early period.

During 1840, the number of first applications was 7129, above the age of fifteen years. Upwards of one-fourth of this number were under the age of 30, and above 3000 were under 35: the average age of the whole was 43¼ years. Hence, the age of 43, is that, at which persons in the parish of Saint Giles's begin to be unable to support themselves. It is, therefore, the period at which their savings ought to produce a return. The two following examples are calculated for the purpose of meeting the exigency.

(1) Suppose a person were to commence at the age of twenty to pay a weekly premium of eighteen-pence to the Insurance Com-

pany, he would be entitled at the age of forty-three, to receive £10 every year afterwards during the remainder of his life.

(2) If a person, aged fourteen years, instead of drinking a pint of beer daily, were to save the money which the beer would cost him, or *one shilling and one penny per week*, and pay it weekly into the Insurance Office, he would receive at the age of forty-three, the sum of £10 every year as long as he lived.

These facts are sufficiently decisive of the assertion, that every man and woman in England who drinks a pint of beer daily, is as capable of securing their own independence in their declining years, as any individual among the middle classes of society who is dependent for his support upon his own industry. The question which every labouring man must put to himself is this:—"*Shall I continue to drink beer and end my days in a workhouse, or shall I save the money wasted in beer, and render myself as independent in my declining years as the greatest noble in the land?*"

I am also indebted to my friend J. W. Holgate, Esq., of Hendon, for a return of the first applications in the Hendon Union, in 1840. This return, however, does not admit of comparison with the St. Giles's table, because children are included. But it shows the condition of the working classes in the country. The number of first applications, children included, was 222, and the average age of the whole was 35$\frac{2}{5}$ years.

The certain practical effect of these suggestions is sufficiently striking and important. To whom are we to look for their application, is a question which cannot better be asked than in a meeting like the present? For to whom can an address of this kind be made with greater propriety than to those, who having achieved one of the greatest moral reforms for themselves which the world has yet witnessed, are hourly and daily engaged in extending its benefits to all their fellow creatures without distinction.

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